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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,628	12/02/2003	Alastair D. Walker	84718	2001
20736	7590	06/28/2005		
MANELLI DENISON & SELTER 2000 M STREET NW SUITE 700 WASHINGTON, DC 20036-3307				
EXAMINER KIM, TAE JUN				
ART UNIT		PAPER NUMBER		
3746				

DATE MAILED: 06/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/724,628

Applicant(s)

WALKER ET AL.

Examiner

Ted Kim

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12/02/2003</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the (barrier or gate of claim 18) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- In claim 7, “substantially angularly presented” is unclear in scope as to whether it is or it isn’t angularly presented.
- Claims 5, 6, 10, 11, 13, 14 are indefinite as “in the order of [range]” does not define what is claimed. “In the order” allows for a difference in magnitude of about a factor of 10, in the context of “order of magnitude analysis” and so it fails to define the metes and boundaries of the claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 7, 8, 13-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Adkins (4,497,445). Adkins teaches a diffuser arrangement for an engine, the diffuser arrangement (multiple applicable embodiments) comprising a wall surface in a fluid flow conduit formed with an aperture e.g. 14 between an upstream part of the wall surface 11 and a downstream part of the wall surface (could be read on 13, 12, 22, 20A, etc.), the

arrangement wherein the downstream part having a step displacement away from a projected profile of the upstream part of the wall surface whereby in use flow momentum in a fluid flow past the wall surface facilitates flow bleed into the aperture 14; wherein the upstream part has a leading edge to the aperture shaped to enhance flow momentum thereabout towards the aperture with curvature dependent upon expected flow rate and/or cross-section of the conduit including the wall surface; the downstream part has a trailing edge to the aperture which is substantially angularly presented wherein the downstream part is at an angle up to 35° to the principal axis of fluid flow in the conduit; wherein the aperture is divergent away from an opening in the wall surface; wherein the aperture has an aperture wall upon the side towards the downstream part which is substantially perpendicular to the principal axis of fluid flow in the conduit; wherein the aperture is coupled to a cooling system (e.g. 31) of an engine (note that flow in a diffuser expands and thus is inherently cooler than the inlet flow, hence, flow from the diffuser will be cooling fluid); the downstream part is shaped so to create a barrier or gate which causes in use a vortex below that barrier or gate for fluid flow control through the arrangement. The patent teaches a range "in the order" of the claimed ranges; wherein the combined length of the wall surface is three to four times a conduit inlet passage height (see Figure 4, where such a range is shown).

6. Claims 1-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Cornell (3,216,455). Cornell teaches a diffuser arrangement for an engine (col. 1, lines 11+), the diffuser arrangement comprising a wall surface in a fluid flow conduit formed with an

aperture for 15 between an upstream part of the wall surface 10 and a downstream part of the wall surface 12, including B, the arrangement wherein the downstream part having a step displacement away from a projected profile of the upstream part of the wall surface whereby in use flow momentum in a fluid flow past the wall surface facilitates flow bleed 15 into the aperture; wherein the upstream part has a curved leading edge to the aperture shaped to enhance flow momentum thereabout towards the aperture with curvature dependent upon expected flow rate and/or cross-section of the conduit including the wall surface; the downstream part has a trailing edge to the aperture which is substantially angularly presented wherein the downstream part is at an angle up to 35° to the principal axis of fluid flow in the conduit; wherein the angle is 30° to the principal axis of fluid flow in the conduit (note that B is rounded and hence the angle on B can be arbitrarily chosen to meet this range); wherein the aperture is divergent away (Fig. 2, at C) from an opening in the wall surface; wherein the aperture has an aperture wall upon the side towards the downstream part which is substantially perpendicular to the principal axis of fluid flow in the conduit; wherein the aperture is coupled to a cooling system (e.g. 17 in Fig. 2) of an engine (note that flow in a diffuser expands and thus is inherently cooler than the inlet flow, hence, flow from the diffuser will be cooling fluid); the downstream part is shaped so to create a barrier or gate which causes in use a vortex below that barrier or gate for fluid flow control through the arrangement. The patent teaches a range "in the order" of the claimed ranges; wherein the combined length of the wall surface is three to four times a conduit inlet passage height (see e.g. Fig. 4).

7. Claims 1-8, 10, 11, 13-15, 17, 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Edelfelt (3,011,307). Edelfelt teaches a diffuser arrangement for an engine, the diffuser arrangement comprising a wall surface in a fluid flow conduit formed with an aperture 23 between an upstream part of the wall surface 20 and a downstream part of the wall surface (downstream of 23), the arrangement wherein the downstream part having a step displacement away from a projected profile of the upstream part of the wall surface whereby in use flow momentum in a fluid flow past the wall surface facilitates flow bleed into the aperture; wherein the upstream part has a curved leading edge to the aperture shaped to enhance flow momentum thereabout towards the aperture with curvature dependent upon expected flow rate and/or cross-section of the conduit including the wall surface; the downstream part has a trailing edge to the aperture which is substantially angularly presented wherein the downstream part is at an angle up to 35° to the principal axis of fluid flow in the conduit (depending on where the angle is measured); wherein the aperture has an aperture wall upon the side towards the downstream part which is substantially perpendicular to the principal axis of fluid flow in the conduit; wherein the aperture is coupled to a cooling system of an engine (note that flow in a diffuser expands and thus is inherently cooler than the inlet flow, hence, flow from the diffuser will be cooling fluid). The patent teaches a range "in the order" of the claimed ranges. wherein the combined length of the wall surface is three to four times a conduit inlet passage height.

8. Claims 1-15, 17-19 are rejected under 35 U.S.C. 102(b or e) as being anticipated by Dailey et al (6,334,297). Dailey et al teach a diffuser arrangement for an engine, the diffuser arrangement comprising a wall surface in a fluid flow conduit formed with an aperture 36 between an upstream part of the wall surface 30 and a downstream part 32 of the wall surface, the arrangement wherein the downstream part having a step displacement away from a projected profile of the upstream part of the wall surface whereby in use flow momentum in a fluid flow past the wall surface facilitates flow bleed into the aperture; wherein the upstream part has a curved leading edge to the aperture shaped to enhance flow momentum thereabout towards the aperture with curvature dependent upon expected flow rate and/or cross-section of the conduit including the wall surface; the downstream part has a trailing edge to the aperture which is substantially angularly presented wherein the downstream part is at an angle up to 35° to the principal axis of fluid flow in the conduit; wherein the angle is 30° to the principal axis of fluid flow in the conduit (depending on which location of the angle is taken); wherein the aperture is divergent away from an opening in the wall surface; wherein the aperture has an aperture wall upon the side towards the downstream part which is substantially perpendicular to the principal axis of fluid flow in the conduit; wherein the aperture is coupled to a cooling system of an engine; the downstream part is shaped so to create a barrier or gate which causes in use a vortex (col. 4, lines 60+) below that barrier or gate for fluid flow control through the arrangement. The patent teaches a range “in the order” of the claimed ranges.

9. Claims 1, 2, 7-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Verdouw (4,796,429). Verdouw teaches a diffuser arrangement for an engine, the diffuser arrangement comprising a wall surface in a fluid flow conduit formed with an aperture 36 between an upstream part of the wall surface 22, 24 and a downstream part of the wall surface 32, 34, the arrangement wherein the downstream part having a step displacement away from a projected profile of the upstream part of the wall surface whereby in use flow momentum in a fluid flow past the wall surface facilitates flow bleed into the aperture; wherein the downstream part is at an angle up to 35° to the principal axis of fluid flow in the conduit; wherein the angle is 30° to the principal axis of fluid flow in the conduit (depending on the location); wherein the aperture is divergent away from an opening in the wall surface; wherein the aperture has an aperture wall upon the side towards the downstream part which is substantially perpendicular to the principal axis of fluid flow in the conduit; wherein the aperture is coupled to a cooling system of an engine; the downstream part is shaped so to create a barrier or gate which causes in use a vortex below that barrier or gate for fluid flow control through the arrangement. The patent teaches a range "in the order" of the claimed ranges; wherein the combined length of the wall surface is three to four times a conduit inlet passage height.

10. Claims 1-15, 19 are rejected under 35 U.S.C. 102(b) as being anticipated by DePaul et al (4,471,910). DePaul et al teach a diffuser arrangement for an engine, the diffuser arrangement comprising a wall surface in a fluid flow conduit formed with an aperture 1 between an upstream part of the wall surface C and a downstream part of the

wall surface B, the arrangement wherein the downstream part having a step displacement away from a projected profile of the upstream part of the wall surface whereby in use flow momentum in a fluid flow past the wall surface facilitates flow bleed into the aperture; wherein the upstream part has a curved leading edge to the aperture shaped to enhance flow momentum thereabout towards the aperture with curvature dependent upon expected flow rate and/or cross-section of the conduit including the wall surface; the downstream part has a trailing edge to the aperture which is substantially angularly presented wherein the downstream part is at an angle up to 35° to the principal axis of fluid flow in the conduit; wherein the angle is 30° to the principal axis of fluid flow in the conduit (depending on where the angle is measured); wherein the aperture is divergent away from an opening in the wall surface; wherein the aperture has an aperture wall upon the side towards the downstream part which is substantially perpendicular to the principal axis of fluid flow in the conduit; The patent teaches a range “in the order” of the claimed ranges.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Adkins (4,497,445) or Verdouw (4,796,429), as applied above, and further in view of any

of DePaul et al (4,471,910), Dailey et al (6,334,297), or Cornell et al (3,216,455). The above applied art teaches various aspects of the claimed invention but do not teach the curved leading edge. DePaul, Dailey et al and Cornell et al all show a curved leading edge into the aperture. It would have been obvious to one of ordinary skill in the art to employ a curved leading edge in order to streamline the flow into the aperture.

13. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over any of the above prior art in view of Adkins (4,497,445). The above prior art appear to show the claimed range for length to height of the conduit. In order to obviate any doubt, Adkins specifically shows in Fig. 4 such a range is known in the art. It would have been obvious to one of ordinary skill in the art to employ the claimed range, as a well known range used in the art.

14. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over any of the above applied art in view of Dailey et al (6,334,297). The above applied art teach a bleed air line and a cooling circuit. Dailey et al teach a cooling circuit for cooling a turbine engine (see end of abstract) is well known in the art. It would have been obvious to one of ordinary skill in the art to employ a cooling circuit as taught by Dailey et al, in order to provide cooling for hot gas turbine components and prolong their life.

15. Claims 5, 6, 8-11, 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of the above applied prior art. The prior art appear to teach the claimed ranges, however, the claimed ranges are regarded as finding the workable ranges in the art. It


would have been obvious to one of ordinary skill in the art to employ the claimed ranges, as an obvious matter of finding the workable ranges in the art.

Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 703-872-9306 for Regular faxes and 703-872-9306 for After Final faxes. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe, can be reached at 571-272-4444.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>

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